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Difficulties in life after hip fracture and expected hospital supports for patients and their families

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KEYWORDS
Hip fracture;
Rehabilitation;
Long-term care;
Gerontology;
Mixed method design

Summary ***Aim:*** To describe difficulties experienced by patients with hip fracture after subacute care, and support wanted from the hospital following surgery.

Methods: This was a survey study of two community general hospitals in Japan. A questionnaire was sent to patients and/or their family members. Data were collected from 2010 to 2012. This study used both statistical and qualitative content analysis.

Results: The mean number of days since surgery was 613.6 (range 126–1247) days. Four categories of difficulties were formulated: 'difficulties in activities in daily living (ADL)', 'physical symptoms', 'reduced social activities' and 'anxiety'. 'Difficulties in ADL' included movement, standing/sitting, instrumental ADL and self-care. The most common difficulties in ADL involved walking. 'Physical symptoms' included pain, cognitive impairment, oedema and tiredness. 'Anxiety' included anxiety about recovering ambulatory ability and anxiety about the future. The most common support wanted was continuous rehabilitation at the same hospital.

Conclusions: The greatest difficulties experienced by patients with hip fracture after subacute care were pain and ambulatory problems. The most common support wanted was continuous rehabilitation at the same hospital. Therefore, more pain control care and continuous rehabilitation at the hospital performing surgery is necessary.

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Editor's comment

For many who sustain a proximal hip fracture their future becomes uncertain. For the medical team and nursing staff the challenge is ensuring such patients are fit for early surgery whilst planning their discharge and home care. For the patient their priorities are likely to include immediate concerns, such as pain control and comfort, but also a number of long term issues relating to mobility, caring for themselves and being a burden to others. Exploring Japan's experiences of proximal fractured femur this study adds to the growing evidence of patient experiences following orthopaedic surgery.

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Introduction

Hip fracture is one of the most common and potentially devastating injuries among elderly people, and causes socio-economic problems in developed countries. The risk of institutionalisation following hip fracture among community-dwelling individuals is five times higher in men and three times higher in women compared with those without hip fracture (Morin et al., 2012). The survival rate is significantly decreased 2 years after hip fracture compared with the general population without hip fracture, and the risk is even higher 10 years after hip fracture (Robbins et al., 2006; Tsuboi et al., 2007).

Many developed countries have reduced the length of stay (LOS) in their hospitals to reduce medical costs. In the USA, diagnostic-related groups were introduced in 1983 to limit costs due to over-utilisation of health services. Average LOS for patients undergoing hip fracture surgery is approximately 1 week in the USA, but the mortality risk is significantly higher soon after hospital discharge compared with Japanese patients (Kondo et al., 2010), possibly because patients are discharged too early.

The Japanese Government has tried to reduce LOS to reduce medical costs by instituting a type of fixed payment plan called the 'diagnosis procedure combination' (DPC), and by separating the care provided in rehabilitation hospitals from that provided in acute care settings. DPC was initially introduced in 82 acute care hospitals such as university hospitals in 2003 (Okamura et al., 2005). The average LOS for general wards in Japan was 27 days in 1999, and decreased to 18 days in 2010 (Ministry of Health Labour and Welfare, 2010). In Japan, hospitals that have introduced DPC usually discharge patients with hip fracture to another rehabilitation hospital 2 weeks after surgery, but the timing is dependent on the patient's condition and the rehabilitation hospital. A clinical pathway is used to transfer patients smoothly between acute care hospitals and rehabilitation hospitals. However, patients discharged within 2 weeks of surgery had a significantly higher risk of mortality after discharge compared with patients who stayed in hospital for ⩾40 days, after adjusting for patient condition, treatment and hospital (Kondo et al., 2010). More patients who were discharged from the hospital with shorter LOS had been admitted to another acute care hospital 3 months after surgery compared with those who had a longer initial LOS (Kondo et al., 2009). The number of hospitals that have introduced DPC is increasing every year, and the number was 1496 in 2013 (Ministry of Health Labour and Welfare, 2013). Patients may experience more difficulties in daily life since introduction of the DPC, but there is little information about how patients with hip fracture cope after discharge in Japan.

Archibald (2003) reported patient experiences of hip fracture based on five patients aged >65 years. He collected data from patients with subacute care needs, and described their experiences of recovering from a hip fracture. These included injury, pain, recovery and disability. However, little is known regarding the experience of patients with hip fracture following subacute care. This study focused on difficulties in daily life experienced by patients with hip fracture following subacute care for up to 3.5 years following surgery.

The aims of this study were: (1) to provide information on the needs of patients with hip fracture following subacute hospital care; (2) to offer guidance to orthopaedic administrators on what they could do to enhance the quality of follow-up care for patients with hip fracture; and (3) to compare the difficulties experienced and support wanted by patients before and after introduction of the DPC.

Methods

Design

This survey study was undertaken in two community general hospitals in Japan (400–500 beds in

each). Hospital 1 is located in Tokyo and introduced DPC in 2008. Hospital 2 is in Aichi prefecture and introduced DPC in 2009. Demographic data were collected from hospital records. A questionnaire was sent to patients and/or their family members about difficulties experienced, support they wanted from the hospital, and health outcomes after discharge following hip fracture surgery. Text data were analysed qualitatively, and data from before and after introduction of the DPC were compared quantitatively.

Sample

Patients aged ⩾65 years who had experienced hip fracture for the first time and who were admitted to one of the two study hospitals for surgery between April 2007 and March 2011 were included in this study. Exclusion criteria were: admission to hospital before hip fracture; unable to walk with or without assistance before hip fracture; fractures caused by metastatic cancer; more than one fracture at the same time; and death during hospitalisation.

Data collection

Data were collected between 2010 and 2012. The hospitals provided access to the medical records of patients who had hip fracture surgery during the study period. During the medical record review, patients were selected according to the above inclusion and exclusion criteria. Variables collected from medical records included patient demographics, treatments and outcomes at discharge. Patient demographics included age, gender, comorbidities, ambulatory ability before fracture, location of residence before fracture, and who they lived with. Data regarding treatments included dates of admission and discharge, and type of surgery. The outcomes at discharge included ambulatory ability at discharge and discharge location.

Comorbidities were defined as the conditions that patients had before surgery. Each comorbidity was collected using a three-level scale (0 = never had, 1 = used to have but currently does not have, 2 = currently has). The main comorbidities were anaemia, cancer, cerebrovascular disease, heart failure, chronic obstructive pulmonary disease, dementia, depression, diabetes mellitus, epilepsy, gastrointestinal disorder, hypercholesterolaemia/lipidaemia, hypertension, ischaemic heart disease, mental disorder, myocardial infarction, osteoarthritis, osteoporosis, paralysis, Parkinson's disease, pneumonia, renal failure, rheumatoid arthritis, urinary incontinence, vertebral disorder, fracture of the leg or vertebra, and other conditions. Complications were defined as conditions that occurred during or after hip fracture surgery, and included anaemia, urinary tract infection, delirium/dementia, deep vein thrombosis, respiratory disorders, cardiovascular disorders, neurological disorders, infection or necrosis of surgery site, and other conditions. Ambulatory ability was determined from the medical records and a questionnaire using a six-level scale (1 = walk independently without use of equipment, 2 = walk with a cane, 3 = walk with a walking frame or cart, 4 = walk with people's assistance, 5 = use wheelchair, 6 = confined to bed) (Kondo et al., 2010).

A letter was sent from a co-investigator at each hospital to the patients who met the inclusion criteria. The informed consent form and the survey were sent to the billing address used during the patient's last hospitalisation. The patients and/or their family members were asked to sign the consent form, and complete and return the questionnaire in a self-addressed stamped envelope within 2 weeks if they agreed to participate in the study. The questionnaire asked the patients to describe, in their own words: (1) difficulties experienced after hospital discharge; and (2) support they wanted from the hospital where they had received surgery following discharge (e.g. home visits). In addition, the questionnaire asked about ambulatory ability and place of residence at 3 months and at the time of investigation, and survival/death (Table 1) because these conditions would be related to difficulties in the activities of daily living (ADL).

Table 1 Questionnaire.

1	Where did you live at 3 months after surgery?
2	Where did you live now?
3	How well did you walk at 3 months after surgery?
4	How well do you walk now?
5	Is the patient alive now?
6	If no, please tell us when the patient died and the cause of death.
7	Please freely describe any difficulties in patient's life and care after discharge.
8	Please let us know supports from the hospital that you wanted after discharge (e.g. preparation for discharge, home visit care)

Ethical considerations

This study was approved by the Institutional Review Board at each hospital. A survey was mailed to participants with an informed consent form that included a brief description of the study and the survey, with clear instructions about how to complete and return the voluntary, confidential survey.

Data analysis

Statistical Package for the Social Sciences Version 21.0 (SPSS Inc., IBM, New York, USA) was used for statistical analysis. Patients' characteristics before and after introduction of the DPC were compared. Student's *t*-test was used to compare age (continuous variable). Mann–Whitney U-test was used to compare comorbidities (ordinal variables) and continuous variables that did not have equal variance according to Levene's test, such as LOS and days after surgery. Nominal variables, such as discharge place and ambulatory ability at discharge, were analysed using Chi-squared test. Other nominal variables, such as gender, place of residence before fracture, living alone before fracture, incidence of complications and mortality, were analysed by Fisher's exact test because of an expected cell value of <10.

Qualitative content analysis was used to analyse patients'/families' responses (Graneheim and Lundman, 2004). The hand-written answers were fully transcribed for computer use, and systematically coded and categorised. Descriptions for two questions were analysed separately. Text analysis was conducted in several steps:

1. The first author read each answer several times to become immersed in the data and to gain an overall understanding of the material.
2. The text in each answer was divided into meaning units and condensed according to the main content. Statements that did not answer the questions and statements that said there were no difficulties or no support was required were excluded. Next, the units were coded.
3. The codes were grouped into subcategories and categories for each question.
4. To validate the analysis, the three investigators discussed and revised the coding and categorisations repeatedly until they reached a high level of agreement on how to sort the codes.
5. Finally, another co-investigator, who was a head nurse of an orthopaedic unit and had not participated in the coding and categorisation process, classified meaning units into a category-code table for each question. The rates of agreement were calculated using Scott's formula (Scott, 1955).

Results

Comparison between participants and non-participants

Questionnaires were sent to 701 patients, and were returned by 434 patients/families (61.9%). Among the 434 respondents, 94 (21.7%) stated that they experienced difficulties in their daily lives. Thirty-one respondents (7.1%) stated that they had no difficulties, and 22 respondents' (5.1%) statements were unclear regarding whether they experienced difficulties; these respondents were excluded. Among the 434 respondents, 46 (10.6%) indicated what support they would like from the hospital. Fourteen respondents (3.2%) stated that no support was necessary and 15 respondents' (3.5%) statements were unclear about what support they would like; these respondents were excluded. Among an initial total of 701 patients, this study analysed data from 124 patients/families (17.7%) who stated that they had difficulties or indicated what support they would like (Fig. 1). Among the 124 participants, 30 (24.2%) patients and 85 (68.5%) families completed the questionnaire. The identity of the remaining nine respondents (7.3%) was unknown.

Participants had fewer complications after surgery ($P = 0.028$) and more participants had survived ($P = 0.031$) than non-participants. Six families whose relatives had died completed the questionnaire. There were no significant differences in age, gender, ambulatory ability before fracture, number of comorbidities, ambulatory ability at discharge, LOS, and the percentage of patients who were discharged to their home between participants and non-participants. There was no significant difference in participation rate before and after introduction of the DPC: 16.4% ($n = 44$) and 18.5% ($n = 80$), respectively. There was no significant difference in the participation rate between hospitals: 15.9% ($n = 39$) for Hospital 1 and 18.7% ($n = 85$) for Hospital 2.

Participants' characteristics

Table 2 describes the participants' characteristics. The mean age of the participants was 81.4 (standard deviation 7.8, range 65–97) years, 80.6% were female, 89.4% could walk independently with or without equipment before their hip fracture, 62.5% had received compression hip screw surgery rather than hip replacement, and 65.3% could walk

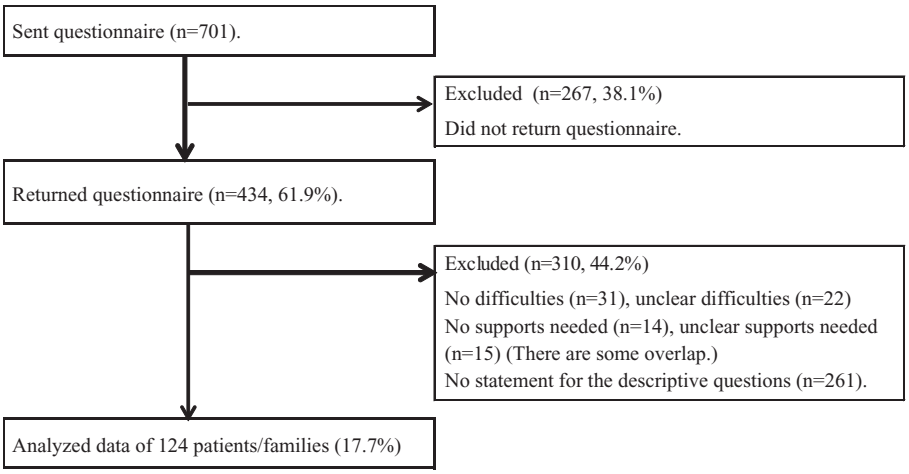

Fig. 1 Participation process.

independently with or without equipment at discharge. At hospital admission, 49.2% of participants had hypertension, 21.2% had a history of cerebrovascular disease, 18.4% had dementia, and 16.9% had diabetes mellitus. Regarding family members who lived with the patients before fracture, 39.5% were sons, 32.3% were spouses, 30.6% were grandsons/granddaughters, 26.6% were daughters-in-law, 25.0% were daughters, 12.1% were sons-in-law, 0.8% were siblings and 3.2% were others. Mean LOS was 33.3 (range 10–107) days (Fig. 2), and mean number of days since surgery was 613.6 (range

Table 2 Comparison of patient's characteristics between pre- and post-DPC introduction.

	Total ($n = 124$)	Pre-DPC ($n = 44$)	Post-DPC ($n = 80$)	*P* value
Demographics				
Age, mean (SD)	81.4 (7.8)	80.8 (1.1)	81.8 (0.9)	0.500*
Female gender, *n* (%)	100 (80.6)	33 (75.0)	67 (83.8)	0.246ǂ
Able to walk independently with or without equipment before fracture, *n* (%)	110 (89.4)	40 (93.0)	70 (87.5)	0.540ǂ
Lived in their home before fracture, *n* (%)	121 (97.6)	42 (95.5)	79 (98.8)	0.287ǂ
Lived alone before fracture, *n* (%)	18 (14.5)	4 (9.1)	14 (17.5)	0.288ǂ
Comorbidity score, mean rank		61.5	63.1	0.817§
Hospital stay				
Compression hip screw type of surgery, *n* (%)	82 (66.1)	32 (72.7)	50 (62.5)	0.250#
Had at least one complication, n (%)	27 (21.8)	2 (4.5)	25 (31.3)	<0.001ǂ
Discharged to their home, *n* (%)	49 (39.5)	9 (20.5)	40 (50.0)	0.001#
Able to walk independently with or without equipment at discharge, *n* (%)	81 (65.3)	30 (68.2)	51 (63.8)	0.620#
Length of stay, mean (median)	33.3 (16.4)	24.2 (7.3)	38.3 (17.9)	<0.001§
At 3 months after surgery				
Able to walk independently with or without equipment at 3 months after surgery, *n* (%)	82 (66.7)	32 (72.7)	50 (63.3)	0.287#
Lived in their home 4 months after surgery, *n* (%)	73 (59.8)	21 (48.8)	52 (65.8)	0.068#
At the time of investigation				
Days after surgery, mean (median)	613.6 (570.5)	904.3 (238.5)	453.8 (449.5)	<0.001§
Able to walk independently with or without equipment at the time of investigation, *n* (%)	76 (65.0)	28 (71.8)	48 (61.5)	0.273#
Lived in their home at the time of investigation, *n* (%)	92 (80.0)	30 (83.3)	62 (78.5)	0.546#
Dead, *n* (%)	6 (4.8)	5 (11.4)	1 (1.3)	0.021ǂ

* *t*-test.
§ Mann–Whitney *U* test.
ǂ Fisher's exact test.
Chi-square test.

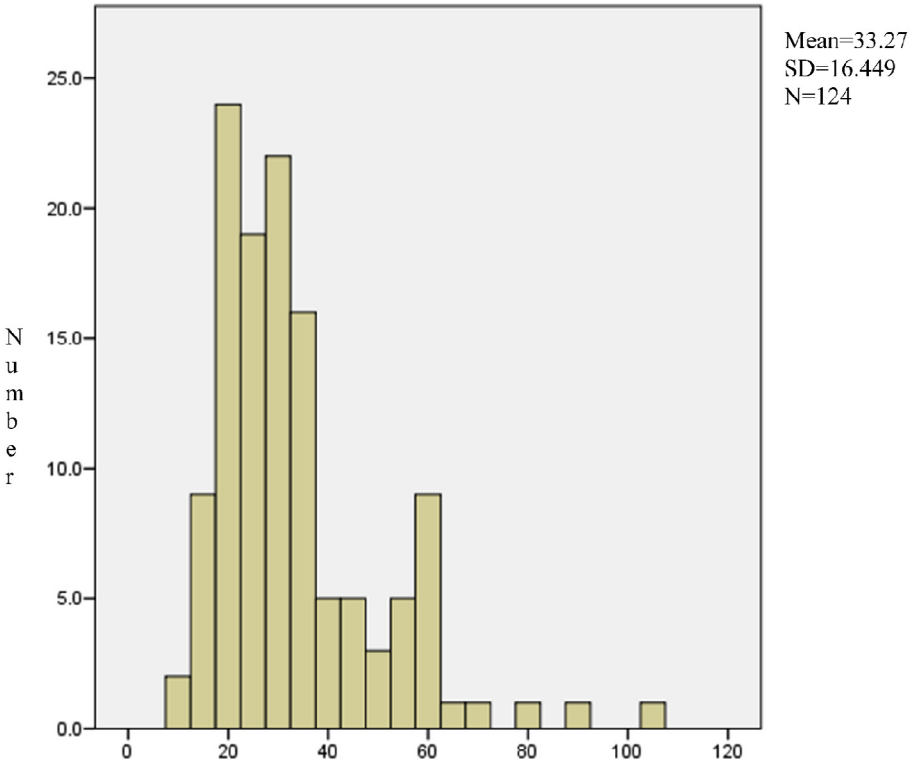

Fig. 2 Length of stay (days).

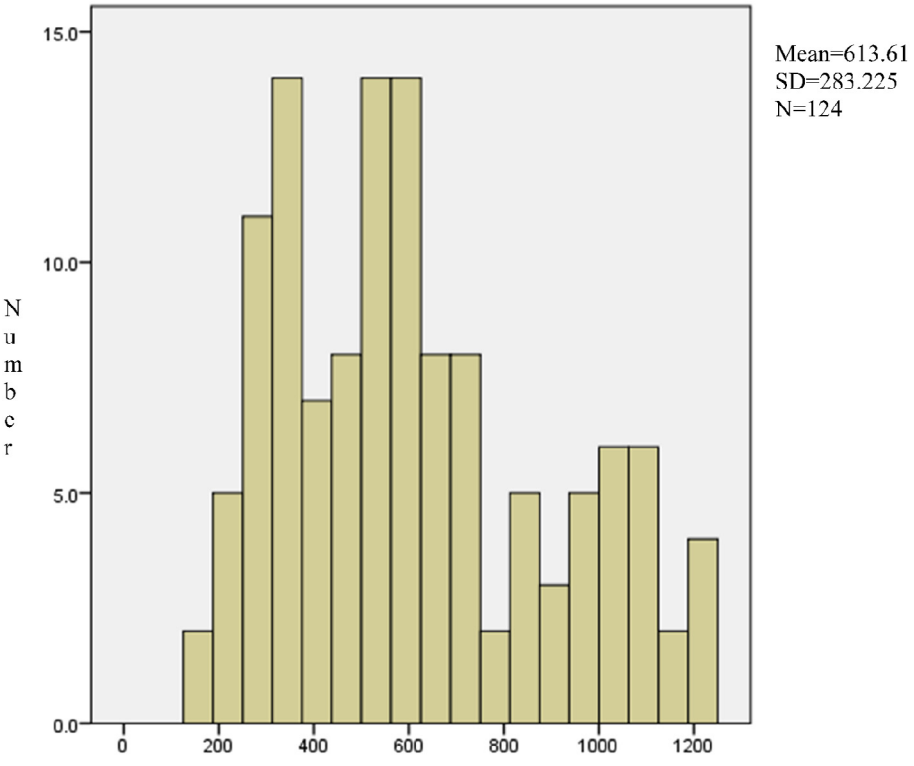

Fig. 3 Days after surgery.

126–1247) days (Fig. 3). In addition, 65.0% of patients were able to walk independently with or without equipment at the time of investigation, and 4.8% of patients had died.

Comparison of participants' characteristics before and after introduction of the DPC

Table 2 compares the patients' characteristics before and after introduction of the DPC. There were no significant differences in demographics. After introduction of the DPC, more patients had complications ($P < 0.001$) but had survived ($P = 0.021$). The LOS was significantly longer after introduction of the DPC ($P < 0.001$). There was no significant difference in place of residence and ambulatory ability at 3 months and at the time of investigation.

Difficulties experienced after discharge following hip fracture surgery

Difficulties experienced, number of days since surgery at the time of investigation, and comparison of the number of difficulties experienced before and after introduction of the DPC are summarised in Table 3. The agreement rate of the authors was 95.9%. Four categories of difficulties were formulated: "difficulties in ADL", "physical symptoms", "reduced social activities" and "anxiety".

"Difficulties in ADL" included four categories: movement, standing/sitting, instrumental ADL and self-care. The most common difficulty in ADL was movement, but the mean number of days since surgery was greatest for patients who reported difficulty with standing/sitting (774 days). The most common difficulty in the movement category was walking (21 meaning units). Comments regarding difficulties with walking included:

"I cannot walk alone."

"My walking ability has not yet recovered."

"Her walking ability did not recover although she was hospitalised in a specialised rehabilitation hospital for a month."

"The patient could walk for several months after the fracture, but she cannot walk now."

"He cannot walk without support any more because of weakened muscle strength."

The second most common difficulty in ADL was related to standing/sitting. In traditional Japanese houses, occupants do not use chairs and instead sit down on tatami mats with flat cushions. The typical formal style of seating involves kneeling with the tops of the feet flat on the floor. Four patients found this type of sitting difficult. Comments regarding difficulties related to standing/sitting included:

"I need a hand rail when I stand up and sit down on the toilet."

"It is difficult to sit down and stand up because she feels pain."

The third most common difficulty was instrumental ADL, such as housework, cooking and cleaning. Comments regarding difficulties related to instrumental ADL included:

"I cannot clean my house because of pain."

"She cannot do most of housework that she used to do because it is hard to walk."

Self-care included toileting, grooming and bathing. The most common difficulty with self-care was toileting. Comments regarding difficulties related to toileting included:

"The patient uses a diaper because she cannot stand up."

"He cannot go to the toilet alone any more."

"Physical symptoms" included pain, cognitive impairment, oedema and tiredness. Most pain was related to the leg that underwent surgery. Although some descriptions did not mention the specific location of pain, it seemed to be related to the fractured leg. The mean number of days since surgery of patients who reported pain was 745 days, and the maximum was 1246 days. Comments included:

"It is hard for me that the pain has not disappeared since discharge."

"I feel pain on my femur when I walk."

"I have pain and still use pain killers."

"Reduced social activities" included one subcategory of reduced outdoor activities, which included three codes: reduced amount of exercise, reduced frequency of going out and cannot go out by themselves. Comments included:

"Her frequency of going out is reduced because of weakened legs."

"Anxiety" included two subcategories: anxiety about recovering ambulatory ability and anxiety about the future. Comments included:

"I worry about life when I get sick because I live alone."

Fig. 4 summarises the difficulties experienced by patients with hip fracture after subacute care. The

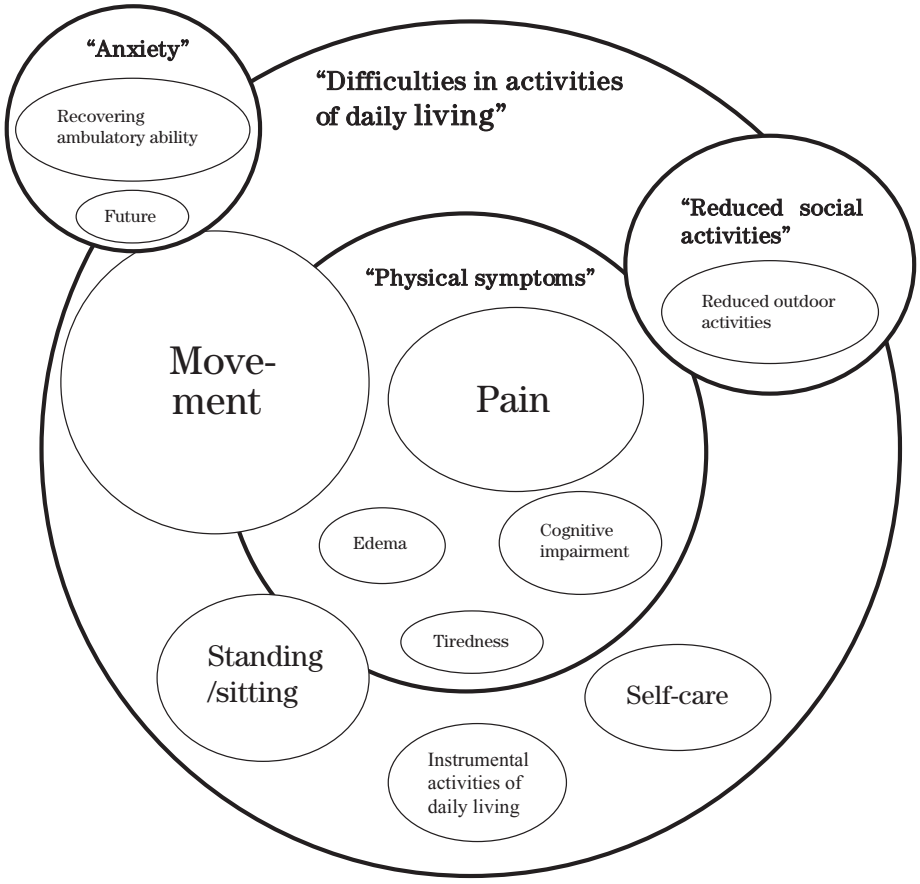

Fig. 4 Hip fracture patients' difficulties in daily life after subacute care.

larger circle represents the larger number of statements. The most common difficulties experienced were difficulties in ADL, especially movement. The most common difficulty in movement was walking. Some of the difficulties in ADL were caused by physical symptoms, such as pain or cognitive impairment. The most common physical symptom was pain. Elderly patients had problems with reduced social activities, but they felt they had greater difficulties in ADL. Some patients were anxious about recovering their ambulatory ability or the future, but the average number of days since surgery was shorter among patients who reported anxiety compared with other subcategories (Table 3).

Support wanted from the hospital

Support wanted from the hospital was categorised into two categories: "preparation for life after discharge" and "continuing care after discharge" (Table 4).

There were seven subcategories in total, but one subcategory (rehabilitation at the same hospital), which had the highest number of meaning units (17), overlapped two categories. The first code "extended rehabilitation days" in the "rehabilitation at the same hospital" subcategory can be included in "preparation for life after discharge". The second code, "rehabilitation at the hospital without transferring to another hospital", could be provided either during or after discharge. The third code, "outpatient rehabilitation at the hospital", should be provided after discharge. Therefore, it was included in "continuing care after discharge". Comments regarding extended rehabilitation days included:

"We wanted the hospital to perform rehabilitation longer with medical insurance."

"She wanted to have outpatient rehabilitation for at least 7 months."

One comment regarding rehabilitation at the hospital without transferring to another hospital was:

"I hope the hospital provides rehabilitation. The patient had anxiety about travelling here and back for the rehabilitation."

Comments regarding outpatient rehabilitation at the same hospital, which was the most common support wanted by patients/families, included:

"I hope there is a system where the patient can receive rehabilitation at the same hospital after discharge."

"I wonder if the patient could physically recover well if the hospital had an outpatient rehabilitation system."

"Preparation for life after discharge" had five categories. A comment regarding the introduction of social welfare services was:

"We needed information about all the options for social welfare services, such as home visit services."

Comments regarding instruction for life after discharge included:

"I wanted the explanation about when my pain would be relieved, as I had much pain and I was afraid when it was not cured after discharge."

"I wanted to hear from specialists what she can do at home for rehabilitation in detail."

Comments regarding extended LOS included:

"Family member was afraid that the patient was discharged in unstable condition. I hope the hospital discharges patients according to the patient's condition."

"I wanted the hospital to keep the patient longer until she could move following rehabilitation."

A comment regarding support with transfer to another hospital was:

"I wanted the hospital to transfer the patient directly to another rehabilitation hospital. She had to stay at home for 2 days before transfer. We needed to borrow a wheelchair, and the transfer was very hard."

A comment regarding enriching the rehabilitation programme was:

"I wanted to receive rehabilitation as part of discharge preparation."

Another subcategory of "continuing care after discharge" is "care after discharge". This subcategory included two mental care units, type of support for asking questions, home visit nursing care and care after discharge without specification. A comment regarding mental care after discharge was:

"We wanted consultation when the patient was depressed because she could not move well."

Comparison of difficulties and support wanted by patients before and after introduction of the DPC

There were no significant differences in the number of meaning units of the four categories of difficulties experienced and the seven subcategories of support wanted from the hospital (Tables 3 and 4).

Discussion

Difficulties experienced after discharge following hip fracture surgery

This study investigated the difficulties in ADL experienced by patients following hip fracture surgery, and indicated that patients still suffered from physical symptoms, reduced social activities and anxiety. The most common difficulties were walking and pain. It is well known that most patients have reduced ambulatory ability after hip fracture (Boonen et al., 2004; Tsuboi et al., 2007). Reduced walking ability is unlikely to recover any more after subacute care. Feldt and Oh (2000) reported that undertreated postoperative pain contributes to poor functional outcome 2 months after surgery. Morrison et al. (2003) reported that postoperative pain is associated with delayed ambulation and a lower locomotion score at 6 months. The present study found that 11.3% of participants experienced pain for more than 2 years after surgery, although this was lower than that reported by Dasch et al. (2008) who investigated patients 6–12 months after discharge (13.4%). The patients reported that they felt pain particularly when they walked. Most anxiety was due to uncertainty about recovering ambulatory ability and reduced social activities that accompanied the mainly reduced ambulatory ability. Functional activity generally stabilised at approximately 4–6 months, and multiple factors influenced final functional outcome (Healee et al., 2011). Pain control, especially within 6 months, is important for recovering ambulatory ability (Feldt and Oh, 2000; Morrison et al., 2003). Dasch et al. (2008) reported that younger age, higher body mass index, and osteosynthesis (e.g. compression hip screw type of surgery) rather than endoprosthesis (e.g. hip replacement) were associated with fracture-related pain after discharge. More pain control care is required.

As the average number of days since surgery was shorter among patients who reported anxiety compared with those reporting other difficulties, anxiety about recovering ambulatory ability may disappear earlier than other difficulties. Patients may have realised their ambulatory ability would not improve

Table 3 Hip fracture patients' difficulties in their life after subacute care.

Category (number of answers)	Subcategory (number of answers)	Code (number of answers)	Days after surgery		Number of answers (%)	
			Mean (median)	Max	Pre-DPC	Post-DPC
Difficulties in activities of daily living (49)	Movement (26)	Walking (21)	664 (605)	1237	9	12
		Transfer to wheel chair (2)			1	1
		Riding bicycle (2)			1	1
		Stair climbing (1)			0	1
	Standing/sitting (12)	Standing up /getting up (4)	774 (655)	1191	2	2
		Kneeling with the tops of the feet flat on the floor (4)			2	2
		Stand and sit down (3)			0	3
		Sitting down on Tatami mat (1)			1	0
	Instrumental activities of daily living (6)	House work in general (3)	572 (518)	1001	2	1
		Cooking (2)			0	2
		Cleaning (1)			0	1
	Self care (5)	Toileting (3)	430 (390)	580	0	3
		Grooming (1)			0	1
		Bathing (1)			0	1
	Subtotal				18 (64.3)	31 (58.5)
Physical symptoms (20)	Pain (14)	Pain on the leg (7)	754 (702.5)	1246	4	3
		Pain without statement of specific location (5)			3	2
		Pain on knee (1)			0	1
		Pain in neck and shoulder (1)			0	1
	Cognitive impairment (3)	Progressed cognitive impairment (2)	583 (614)	657	0	2
		Occurrence of cognitive impairment (1)			1	0
	Edema (2)	Edema on the leg (2)	395 (366)	620	0	2
	Tiredness (1)	Tiredness on the leg (1)	366 (366)	366	0	1
	Subtotal				8 (28.6)	12 (22.6)
Reduced social activities (7)	Reduced outdoor activities (7)	Reduced amount of exercise (3)	631 (601)	1247	1	2
		Reduced frequency of outgoing (2)			1	1
		Cannot go out by themselves (2)			0	2
	Subtotal				2 (7.1)	5 (9.4)
Anxiety (5)	Anxiety for recovering ambulatory ability (4)	Wonder if they will be able to walk (2)	361 (360)	366	0	2
		Wonder if they will be able to walk confidently (1)			0	1
		Wonder if they will be able to walk as well as before fracture (1)			0	1
	Anxiety for future (1)	Afraid of the life when they get sick (1)	437 (437)	437	0	1
	Subtotal				0 (0.0)	5 (9.4)
Total (81)					28	53
DPC: Diagnosis Procedure Combination					$X^2 = 3.1$, df = 3, $P = 0.374$	

Table 4 Supports needed from hospitals.

Category (number of answers)	Subcategory (number of answers)	Code (number of answers)	Number of answers (%)	
			Pre-DPC	Post-DPC
Preparation for the life after discharge (30)	Introducing social welfare services (9)	Introducing rehabilitation facility (5)	1	4
		Providing information about services after discharge in detail (4)	1	3
		Subtotal	2 (15.4)	7 (20.0)
	Instruction for life after discharge (9)	Teaching families how to take care/make rehabilitation for patient (3)	0	3
		Advices for lives after discharge (2)	0	2
		Explanation for patient's assumed condition in the future (2)	0	2
		How to care for the surgery site (1)	1	0
		Detail explanation at discharge (no specification) (1)	0	1
		Subtotal	1 (7.7)	8 (22.9)
	Extended length of stay (3)	Wanted to be hospitalized longer (2)	0	2
		Wanted to be hospitalized until cured (1)	0	1
		Subtotal	0 (0.0)	3 (8.6)
	Support at transfer to other hospital (3)	Paperwork for transferring (1)	0	1
		Attending clinicians when transferring (1)	1	0
		Direct transfer from the hospital (1)	1	0
		Subtotal	2 (15.4)	1 (2.9)
	Enriching rehabilitation program (2)	Walking out rehabilitation for preparation of discharge (1)	0	1
		Early rehabilitation after surgery (1)	1	0
		Subtotal	1 (7.7)	1 (2.9)
		Extended rehabilitation days (4)	3	1
Continuing care after discharge (18)	Rehabilitation at the same hospital (17)	Rehabilitation at the hospital without transferring to another hospital (3)	1	2
		Outpatient rehabilitation at the hospital (10)	2	8
		Subtotal	6 (46.2)	11 (31.4)
	Care after discharge (5)	Mental care for patient after discharge (2)	0	2
		Kind support for asking questions after discharge (1)	0	1
		Home visit nursing care (1)	1	0
		Care after discharge (no specification) (1)	0	1
		Subtotal	1 (7.7)	4 (11.4)
Total (48)			13	35
DPC: Diagnosis Procedure Combination			$X^2 = 6.0$, df = 6, $P = 0.423$	

any more by 1 year after surgery. "Reduced social activities" was not as great a problem as ADL or physical symptoms for elderly patients because most patients had already retired.

This study collected data from patients after subacute care and found they had similar experiences of pain and disability as reported by Archibald (2003). "Difficulties in ADL" in this study falls under the general category of "disability experience", and "reduced social activities" in this study included the elements of depending on others and being housebound in the "disability experience" within Archibald's study. This study also included cognitive impairment in "physical symptoms". In this study, family members answered questions about the cognitive impairment of the patient, which differed from Archibald's study. Archibald discussed patients' fear of falling, but in the present study, patients reported anxiety about recovering ambulatory ability rather than falls. Nurses need to allow patients to unburden themselves through active listening, whilst explaining the extent to which patients can expect their ambulatory ability to recover.

Support wanted from the hospital

The most common support wanted by patients/families was continuous rehabilitation at the same hospital. Transferring patients created problems not only for older patients but also their families. Some patients/families had difficulties in finding rehabilitation facilities, and others wanted support when transferring to another hospital. The Japanese Government has tried to reduce medical costs by separating acute care and rehabilitation. However, previous studies have revealed that this has not reduced medical costs, and has, in some cases, even increased them (Kawabuchi et al., 2003; Okamura et al., 2005). This system has also increased the burden on patients and their families. It would not be easy to return to the previous system, but it is recognised that it is desirable for patients to receive continuous rehabilitation at the same hospital.

The second most common support wanted by patients/families was instruction about life after discharge. Families wanted to know how to take care of patients, and patients wanted to know how to live with disabilities. Nurses need to discuss these subjects during hospitalisation. Patients/families also wanted care after hospital discharge, such as mental care, the opportunity to ask questions by telephone and home visits. Some hospitals provide such services, but they are not always available. Overall, it was found that patients/families wanted continuous care from the same hospital, even after discharge.

Comparison of difficulties experienced and support wanted before and after introduction of the DPC

There were no significant differences in difficulties experienced and support wanted before and after introduction of the DPC. This is likely to be because LOS did not decrease but instead increased after introduction of the DPC. LOS was probably longer because more patients had complications after introduction of the DPC. The prolonged LOS may also be meeting the wishes of patients and families for a longer period of rehabilitation at the same hospital. In this study, the number of days since surgery differed before and after introduction of the DPC. However, ambulatory ability at the time of investigation was not significantly different. Therefore, difficulties experienced or support wanted from the hospital would not have differed either.

Suggested guidance for programme development towards enhancing quality of care

Pain control was found to be insufficient, and more pain assessment considering risk factors of pain and pain control is necessary in outpatient visits. Many patients/families would like continuous care from the initial acute care hospital. During hospitalisation, nurses need to give patients/families information about life after discharge. There is a need to consider the development of a follow-up system, such as outpatient rehabilitation or home care services.

Limitations of the study

A limitation of this study is the fact that it was based on analysis of written statements from the questionnaire. As patients/families were not interviewed, it was not possible to ask further questions about difficulties experienced and support wanted. Some statements were ambiguous and could not be understood so were excluded. Although the participants in this study were only a portion of the sample from two hospitals in Japan, the number of participants (124 patients/families) was much greater than the study population investigated by Archibald (2003). The number of patients studied before and after introduction of the DPC differed considerably, and this would have analytical limitations. While agreement rates were quite high, each code had a small

number of statements and the results may not be saturated. Further investigations are necessary until data saturation is reached.

This study asked about difficulties experienced and support wanted from the hospital after subacute care. Therefore, this study did not indicate changes in difficulties experienced and support wanted with the passage of time. In addition, the participants were relatively healthy, although a few families responded despite the fact that their relatives had died. Therefore, generalisability is limited.

Conclusion

The most common difficulties experienced by patients with hip fracture after subacute care were pain and ambulatory problems. The most common support wanted by patients/families was continuous rehabilitation at the same hospital. The introduction of DPC did not reduce LOS or alter patient-reported difficulties or desired support. More pain control care and consideration of prolonging rehabilitation at the same hospital are necessary. Further studies with a larger sample and/or interviewing patients/families are necessary to saturate the classification. Longitudinal studies are also necessary to clarify the relationship between the patients' difficulties and the number of days since surgery.

Author contributions

A.K. and E.F. were responsible for the study conception and design. A.K., K.S., I.Y., and C.Y. collected data. A.K., N.H., H.A. and I.Y. performed the data analysis. K.S. and Y.I. provided administrative, technical or material support at study hospitals. A.K. was responsible for the drafting and final manuscript.

Conflict of interest statement

No conflict of interest has been declared by the authors.

Ethical approval

Approvals were obtained from the Institutional Review Board from a university and each hospital. A survey was mailed to participants with an informed consent form that included a brief description of the study and the survey enabling the participants a clear understanding of how to complete and return the voluntary and confidential survey.

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